CLAIMS:

1. A method of operating a communication network comprising a plurality of stations able to transmit data to and receive data from one another, the method comprising:

    monitoring, at each station, the path quality between that station and each other station with which that station communicates;

    recording, at each station, path quality data corresponding to the path quality associated with each said other station;

    setting, at each station, a transmission power value based on the recorded path quality data associated with a selected other station when transmitting data to said selected other station, thereby to increase the probability of transmitting data to said selected other station at an optimum power level; and

    transmitting path quality data corresponding to the path quality between a first and a second station when transmitting other data between the stations, so that path quality data recorded at the first station is communicated to the second station for use by the second station and vice versa.

2. A method according to claim 1 wherein the monitoring of path quality between stations includes monitoring at least one of the path loss, phase distortion, time delay, Doppler shift and multipath fading characteristics of a channel between the stations.

Sub a1

3. A method according to claim 1 or claim 2 wherein the path quality at a station receiving a data transmission is calculated by comparing the measured power of the received transmission with data in the transmission indicating the transmission power thereof.

4. A method according to claim 3 wherein a station receiving such path quality data compares the received path quality data with respective stored path quality data and calculates a path quality correction value from a difference between the received and stored values, the path quality correction value being utilised to adjust the transmission power when transmitting data to the station which transmitted the path quality data.

5. A method according to claim 4 wherein the path quality correction factor is calculated by deriving rate of change data from a plurality of path quality correction factor calculations.

6. A method according to claim 5 wherein the rate of change data is utilised to adjust the transmission power predictively when transmitting data to a station whose path quality correction value is detected to be changing over time.

Sub a2

7. A method according to any one of claims 1 to 6 wherein each station monitors the transmissions of other stations to obtain path quality data therefrom, so that a first station monitoring a transmission from a second station within range of the first station to a third station out of range of the first station can obtain path quality data relating to the third station.

8. A method according to any one of claims 3 to 7 including monitoring, from a first station transmitting data, the background

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noise/interference at a second station receiving a data transmission and adjusting the transmission power value at the station transmitting data to the receiving station, thereby to maintain the required signal to noise ratio at the receiving station.

9. A method according to claim 8 wherein each station includes local background noise/interference data in at least some of its transmissions to other stations, for use by the other stations in adjusting their transmission power values when transmitting data to said each station.

Sub a3

10. A method according to claim 8 or claim 9 including adjusting the data rate of message data transmitted from a first station to a second station according to the transmission power value set at the first station and the required signal to noise ratio at the second station.

11. A method according to any one of claims 8 to 10 including adjusting the length of message data packets transmitted from a first station to a second station according to the transmission power value set at the first station and the required signal to noise ratio at the second station.

12. A method according to any one of claims 1 to 11 wherein each station monitors the transmissions of other stations to obtain background noise/interference data therefrom, so that a first station monitoring a transmission from a second station within range of the first station to a third station out of range of the first station can obtain background noise/interference data relating to the third station.

13. A method according to any one of claims 1 to 12 including selecting, opportunistically, a station for transmission of data thereto according to the path quality and/or background noise/interference data associated therewith.

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14. Communication apparatus operable as a station in a network comprising a plurality of stations which can transmit data to and receive data from one another, the communication apparatus comprising:

transmitter means arranged to transmit data to selected stations;

receiver means arranged to receive data transmitted from other stations;

signal strength measuring means for measuring the power of received transmissions;

processor means for calculating and recording path quality data corresponding to the path quality associated with other stations; and

control means for adjusting the output power of the transmitter according to the path quality between the apparatus and a destination station,

wherein the processor means is arranged to include the path quality data in its transmissions to other stations for use by them, and to receive path quality data in transmissions from other stations for use in calculating updated path quality data.

15. Communication apparatus according to claim 14 wherein the processor means is arranged to calculate the path quality by comparing data in received transmissions relating to their transmission power

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and/or a previously measured path quality with the measurements made by the signal strength measuring means.

16. Communication apparatus according to claim 15 wherein the processor means is arranged to monitor at least one of the path loss, phase distortion, time delay, Doppler shift and multipath fading characteristics of a channel between the apparatus and other stations.

Sub a4 17. Communication apparatus according to claim 15 or claim 16 wherein the processor means is arranged to extract path quality data from received transmissions, to compare the path quality data with the measured power of received transmissions, and to calculate a path quality correction factor from the difference therebetween, the path quality correction factor being utilised by the control means to adjust the output power of the transmitter.

18. Communication apparatus according to claim 17 wherein the processor means is adapted to derive rate of change data from a plurality of path quality correction factor calculations, thereby to compensate for variations in the path quality between stations.

19. Communication apparatus according to claim 18 wherein the processor means is arranged to utilise the rate of change data to adjust the transmission power predictively when transmitting data to a station whose path quality correction value is detected to be changing over time.

Sub a5 20. Communication apparatus according to any one of claims 14 to 19 wherein the processor means is arranged to monitor path quality data in transmissions from other stations, so that a first station monitoring a transmission from a second station within range of the first station to a

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third station out of range of the first station can obtain path quality data relating to the third station.

21. Communication apparatus according to any one of claims 18 to 20 wherein the processor means is arranged to store path quality data for each of a plurality of stations and to set an initial transmission power value when initiating communication with any of said plurality of stations according to the respective stored path quality data.

22. Communication apparatus according to any one of claims 14 to 20 wherein the processor means is arranged to monitor background noise/interference data in transmissions from other stations, so that a first station monitoring a transmission from a second station within range of the first station to a third station out of range of the first station can obtain background noise/interference data relating to the third station.

23. Communication apparatus according to any one of claims 14 to 22 wherein the processor means is adapted to select, opportunistically, another station for transmission of data thereto according to the path quality and/or background noise/interference data associated therewith.